

Mr. Trowbridge gave his views as to the most probable composition of meteor trains, and presented several hypotheses which might account for their long-continued luminosity. The hypotheses advanced were the following: (1) Incandescence of the particles of the train; (2) phosphorescence of the train; (3) electrical discharges; (4) reflection of the light from the sun, moon or stars by the particles of the train; (5) electrons striking the meteoric dust or the air particles in or about the train, causing a fluorescent glow similar to that in a Crookes tube. The source of the electrons may be either the highly heated meteor, in which case the long-continued luminosity of the train must be accounted for by a retardation of the fluorescence, possibly due to the low temperature, or the electrons may come from the sun; in this case the explanation would be similar to that lately given by Arrhenius for the light of the aurora. The author stated that this last hypothesis had not, so far as he knew, been previously advanced, and that the balance of evidence seemed to show that the luminosity of the persistent trains must be primarily caused by energy of an electrical nature. The subject is one of practical importance, owing to its bearing on meteorology.

The paper by Dr. S. C. Mitchell gave the results of observations on the flash spectrum taken by him at Sawah Loento, Sumatra, during the eclipse of May 18, 1901. Dr. Mitchell became, by the courtesy of the astronomical director of the Naval Observatory, a member of the eclipse expedition sent out by this government. The spectroscope employed was a Rowland objective plane grating of 15,000 lines, used in connection with a cœlostat. The weather experienced at Sawah Loento was like that at almost every astronomical location in Sumatra, cloudy throughout totality. However, through clouds, a spectrum of the flash at third contact was obtained which showed 374 bright lines between F and H. Investigations into the reasons for the differences of intensities in the flash and the Fraunhofer spectrum showed that the intensities depend on the heights to which the reversing layers of the different metallic elements

around the sun extend. It was found possible to arrange the elements in three groups according to their atomic weights.

Comparisons were made with Dr. Norman Lockyer's list of 'enhanced' lines, or those stronger in the spark than in the arc, in order, if possible, to confirm Lockyer's idea that the 'enhanced' lines play an important rôle in the chromosphere spectrum. Fifty-seven per cent. of the 'enhanced' lines of titanium were found in the flash, but at the same time all of these lines corresponded without exception to strong lines in the sun. On the other hand, so many cases were found where a strong 'enhanced' line was not matched in the sun by a strong Fraunhofer line, nor by any line in the flash spectrum, that it seemed that the measures did not support Lockyer's opinion.

Section adjourned.

F. L. TUFTS,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of the Academy on the evening of March 3, about thirty-five persons present, Mr. L. T. Genung, of St. Louis, gave a general discussion of the Lepidoptera, their structural characteristics, habits and adaptations. He exhibited some of the more striking specimens of the Denton collection of butterflies, recently presented to the Academy of Science, and discussed the meaning of the various colors.

A paper by Mr. C. F. Baker, entitled 'A Revision of the Elephantopæ, I,' was presented by title.

Two persons were elected to active membership.

WILLIAM TRELEASE,
Recording Secretary.

THE COLORADO ACADEMY OF SCIENCE.

At the annual meeting of the Academy, held February 11, 1902, in rooms of the State Historical and Natural History Society, State House, Denver, Colorado, officers were elected, and chairmen of sections appointed February 27, resulting in the selection of the following for the year 1902:

President, A. M. Collett; *First Vice-President*, Mrs. Cornelia Miles; *Second Vice-President*, Z. X.

Snyder; *Secretary and Treasurer*, Will. C. Ferril; *Executive Committee*, George L. Cannon, Ellsworth Bethel, Charles I. Hays, and *ex officio*, A. M. Collett and Will C. Ferril

Sections and chairman of each, as follows: *Botany*, Ellsworth Bethel; *Zoology*, Alva H. Felger; *Geology*, George L. Cannon; *Microscopy*, Dr. J. B. Kinley; *Meteorology and Physical Science*, N. M. Fenneman; *Nature Study*, S. Arthur Johnson; *Anthropology and Ethnology*, Dr. A. L. Bennett.

The Colorado Academy of Science is limited in its membership to those of the State Historical and Natural History Society, who may be engaged in scientific work and study.

WILL. C. FERRIL,
Secretary.

THE ELISHA MITCHELL SCIENTIFIC SOCIETY.

THE 140th meeting of the Society was held on March 11 at the University of North Carolina.

The following papers were read:

'Enzymes': Dr. A. S. WHEELER.

'Reversible Action of Enzymes': Dr. R. H. WHITEHEAD.

'Molecular Attraction': Dr. J. E. MILLS.

CHAS. BASKERVILLE,
Secretary.

NEW YORK ASSOCIATION OF BIOLOGY TEACHERS.

THE first meeting for the current year of the New York Association of Biology Teachers was held at 43 Hancock Street, Brooklyn, N. Y., on January 31, 1902.

The following officers were elected for the year:

President, Dr. H. R. Linville, DeWitt Clinton High School; *Vice-President*, Dr. E. F. Byrnes, Girls' High School; *Secretary*, George W. Hunter, Jr., DeWitt Clinton High School; *Treasurer*, Miss M. F. Goddard, Peter Cooper High School.

Two papers were read, entitled, 'The Pedagogical and Ethical Content of Biology,' by Miss E. F. Byrnes, and 'The History of Zoology in the Secondary Schools of the United States,' by Miss Marion R. Brown, of the Erasmus Hall High School.

The purpose of the club is to discuss and, if possible, to determine, the best methods of teaching biology in the secondary schools. The club is now entering upon the third year

of a very successful existence with a much increased membership.

G. W. HUNTER, JR.,
Secretary.

DISCUSSION AND CORRESPONDENCE.

MOVEMENTS TOWARD UNION AMONG GEOGRAPHERS.

THE recent publication in SCIENCE of letters from Professor Russell, Professor Davis, and Mr. Stanley Brown recalls various other movements toward union among geographers. One of the earlier of these led to the founding of the American Geographical Society in New York; another to the institution of the National Geographic Society, with headquarters in Washington; others to the establishment of geographic clubs or societies in several centers; and still others to the enlargement of the geographic organization in Philadelphia first from a club to a society, then to a geographic institute. At least two of these organizations (those headquartered in New York and Washington, respectively) were originally designed to meet precisely such needs as those outlined by Professors Russell and Davis, together with the equally obvious need of diffusing the elements of geographic knowledge through public meetings and periodical publications; yet in both cases the latter function assumed such prominence as measurably to divert attention from the primary purpose. In both societies the modification in plan came about gradually—and it is probable that in both the changes grew out of the natural effort to balance income and expenditure in such wise as to please the majority of the members at each stage of progress. It is true, as the recent correspondents have pointed out, that the present organization of American geographers in a number of societies fails to meet all professional requirements; but it would seem to be an open question whether the needs might not be met more effectively and economically in some existing organization than by adding another to the already overwhelming list of American scientific societies.

Some of the events in the history of the National Geographic Society seem peculiarly

THE COLORADO ACADEMY OF SCIENCE

WILL. C. FERRIL

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